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EXAMINER	
WEST, JEFFREY R	
ART UNIT	**PAPER NUMBER**
2857	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/051,297	Applicant(s) WALTER ET AL.	
	Examiner Jeffrey R. West	Art Unit 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 December 2006.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-17,20 and 21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17,20 and 21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 21 January 2005 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 5, 7, 9, 16, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE Patent No. 4016922 to Popp in view of U.S. Patent No. 5,416,723 to Zyl.

Popp discloses an electrical transducer using a two-wire process (001) comprising an analog sensor that detects a quantity to be measured (009, lines 2-6), an analog end stage which is connected downstream of the sensor at the output end of the transducer (010, lines 32-35 and "13" in Figure 1), a processor circuit (010,

lines 26-27 and "7" in Figure 1), wherein the processor circuit is not connected serially between the sensor and the analog end stage so that an analog measurement signal transmission path is realized (Figure 1), the analog end stage converting an output signal of the sensor into an impressed output current with a magnitude which is a measure of the quantity to be measured and is fixed within a range of about 0 to 20 mA, specifically about 4 to 20mA (010, lines 32-36 and Figure 1), the electrical transducer being controlled by the processor circuit (004, lines 1-8).

Popp discloses the analog measurement signal transmission path including an analog scaling unit ("6" in Figure 1), the output signal of the sensor and at least one analog setting value are supplied to the analog scaling unit (010, lines 1-8 and Figure 1), and the output signal of the analog scaling unit is supplied to the analog end stage (Figure 1).

Popp discloses that the analog scaling unit is an analog arithmetic circuit to which as the at least one analog setting value a DC voltage signal is delivered (010, lines 1-11) wherein the analog arithmetic circuit comprises at least one analog multiplier and at least one sign-evaluating (i.e. adding or subtracting) accumulator acting as an adder and/or subtractor (010, lines 11-19).

Popp discloses a power source that produces a non-zero output current (002, lines 14-16).

Popp discloses that the output signal of the sensor is routed past the processor circuit via the analog signal transmission path (Figure 1) when the processor is

inactive for enabling changes in the quantity being measured to be followed while the processor circuit is inactive (004, lines 1-5).

As noted above, the invention of Popp teaches many of the features of the claimed invention and while Popp does teach providing both an analog path and a digital path wherein the digital path includes a microprocessor that is not active during normal measurement operation but only provided to perform corrections (004, lines 1-5), Popp does not explicitly disclose that the processor be shifted temporarily from an awake mode into a sleep mode in which the processor is inactive.

Zyl teaches a loop powered process control transmitter operating at a loop power of between 4 and 20 mA (column 1, lines 5-16) wherein during normal operation of the process control transmitter, the microprocessor circuit is shifted temporarily from an awake mode into a sleep mode in which the processor circuit is inactive (column 2, lines 20-30 and column 3, lines 14-18).

It would have been obvious to one having ordinary skill in the art to modify the invention of Popp to explicitly disclose that the processor be shifted temporarily from an awake mode into a sleep mode in which the processor is inactive, as taught by Zyl, because the invention of Popp does teach that the microprocessor is inactive during normal transducer operation and Zyl suggests that the combination would have improved the operation of the loop-powered transducer of Popp by complying with the strict power requirement of loop-powered devices (column 2, lines 13-30 and column 4, lines 37-56).

Further, since the invention of Popp does teach providing both an analog path and a digital path wherein the digital path includes a microprocessor that is not active during normal measurement operation but only active to perform corrections (i.e. the duration of the processor activity time is shorter than the duration of the processor inactivity time) and the invention of Zyl teaches that the microprocessor is shifted from an awake mode into a sleep mode, the combination would have provided that the activity time in which the processor circuit is active is much shorter than the time that the processor circuit remains in the sleep mode.

4. Claims 3, 4, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popp in view of Zyl and further in view of U.S. Patent No. 5,886,565 to Yasui.

As noted above, the invention of Popp and Zyl teaches many of the features of the claimed invention including an analog scaling unit as an analog arithmetic circuit to which as at least one analog setting value a DC voltage signal is delivered from a microprocessor. The invention of Popp and Zyl, however, does not specify how this DC voltage is supplied.

Yasui teaches a reference voltage generating circuit having an integrator that generates a reference voltage using a voltage dividing circuit that divides a voltage supplied from a power source for use by the integrator (abstract).

It would have been obvious to one having ordinary skill in the art to modify the invention of Popp and Zyl to include an active integrator for generating the reference voltage, as taught by Yasui because Yasui suggests a corresponding circuit

applicable and needed in the invention of Popp and Zyl in order to generate a reference voltage as well as assuring low power consumption and a stable output characteristic (column 1, lines 44-47).

Further, since the DC voltage signal of Popp and Zyl is generated by the microprocessor, the modification of Popp and Zyl with the control circuit integrator of Yasui would provide an active integrator as part of a control circuit within the processing circuit.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Popp in view of Zyl and further in view of U.S. Patent No. 5,714,903 to Bruccoleri et al.

As noted above, the invention of Popp and Zyl teaches many of the features of the claimed invention and while the combination does teach an analog scaling unit including an analog multiplier, the combination does not specify that the multiplier be a single-quadrant multiplier.

Bruccoleri teaches a low-consumption analog multiplier that is a single-quadrant multiplier (column 4, line 66 to column 5, line 3).

It would have been obvious to one having ordinary skill in the art to modify the invention of Popp and Zyl to specify that the multiplier by a single-quadrant multiplier, as taught by Bruccoleri, because Bruccoleri suggests a corresponding multiplier for use in the invention of Popp and Zyl using a multiplier that would have improved efficiency by lowering current consumption while increasing error compensation (column 4, line 66 to column 5, line 3).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Popp in view of Zyl and further in view of U.S. Patent No. 3,805,092 to Henson.

As noted above, the invention of Popp and Zyl teaches many of the features of the claimed invention and while the invention of Popp and Zyl does teach an analog scaling circuit including an analog multiplier, the combination does not specify the makeup of the multiplier.

Henson teaches an electronic analog multiplier comprising a plurality of transistors (abstract) and a plurality of operational amplifiers (column 4, lines 32-38 and Figure 3).

It would have been obvious to one having ordinary skill in the art to modify the invention of Popp and Zyl to specify the makeup of the multiplier, as taught by Henson, because the combination would have provided a suitable multiplier for use in the invention of Popp and Zyl, that, as suggested by Henson, would have been suitably biased (column 4, lines 32-38) and operated at high operating speed without normally encountered errors caused by the high speed and/or transistor mismatch (column 2, lines 1-11).

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Popp in view of Zyl and Bruccoleri and further in view of U.S. Patent No. 6,057,794 to Takamuki.

As noted above, Popp in combination with Zyl and Bruccoleri teaches many of the features of the claimed invention and while the invention of Popp, Zyl and Bruccoleri, does include an analog scaling unit with an adder, subtractor, and single quadrant multiplier, and further while the combination does include an analog-digital converter as an input to the analog scaling unit, the combination does not specify the makeup of the analog-digital converter.

Takamuki teaches a sigma-delta modulation circuit as part of an analog-digital converter (column 1, lines 6-8) including an analog multiplier, adder, and subtractor (column 10, lines 5-14) with an adder connected through a delay circuit and a converter to the input of a multiplier and an adder and subtractor connected to the output of the multiplier (Figure 5).

It would have been obvious to one having ordinary skill in the art to modify the invention of Popp, Zyl, and Bruccoleri to specify that the analog-digital converter as an input to the analog scaling unit comprises an analog multiplier, adders, and subtractor, as taught by Takamuki, because while the invention of Popp, Zyl, and Bruccoleri is silent as to the makeup of the an analog-digital converter, Takamuki suggests a corresponding circuit applicable and necessary to implement the converter with improved operation through amplitude control using a small, simple configuration (column 2, lines 25-27).

Although the combination of Popp, Zyl, and Bruccoleri provides an analog-digital converter electrically coupled to the analog scaling circuit rather that part of the analog scaling circuit itself, it would have been obvious to one having ordinary skill in

the art to provide the A/D converter, and corresponding sigma-delta circuit with multiplier, adders, and subtractor, and the analog scaling circuit as one circuit in order to adhere to space constraints. Further, it has been held that forming in one piece which has formerly been formed in two pieces and put together involves only routine skill in the art (see Howard v. Detroit Stove Works, 150 U.S. 164 (1893)).

8. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popp in view of Zyl and further in view of U.S. Patent No. 5,207,101 to Haynes.

As noted above, the invention of Popp and Zyl teaches many of the features of the claimed invention and while the invention of Popp and Zyl does teach a circuit connected between the analog scaling unit and the analog end stage for attenuating the sensed signal by performing an average calculation, wherein the attenuating circuit comprises an RC element (Popp, 011, lines 5-20), the combination does not include the specifics of the circuit, specifically, regarding an adjustable time constant.

Haynes discloses a two-wire ultrasonic transmitter comprising a sensor that detects a quantity to be measured (column 2, lines 19-22), an analog end stage, comprising an amplifier circuit, connected downstream of the sensor (Figure 4b, "52"), a processor circuit, including a processor and drive circuit (column 7, lines 41-42) and an analog measurement signal transmission path (see subsequent circuitry from X1 in Figure 4a), the analog end stage including, between the analog scaling unit and the subsequent analog end stage circuitry, an attenuator comprising an RC

element (column 2, lines 58-60 and column 8, lines 52-64), having an adjustable time constant (i.e. adjustable resistor and capacitor values) wherein an error output of the attenuator can be compensate by a control circuit (i.e. comparator with threshold detection) (column 8, line 65 to column 9, line 9).

It would have been obvious to one having ordinary skill in the art to modify the invention of Popp and Zyl to include the specifics of the attenuating circuit, specifically, regarding an adjustable time constant, as taught by Haynes, because the combination would have provided improved transducer operation by allowing modification of the attenuating circuit as desired while, as suggested by Haynes, improving the performance of the transducer of Popp and Zyl by effectively minimizing dead band (column 8, lines 52-64).

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popp in view of Zyl and further in view of U.S. Patent No. 5,252,967 to Brennan et al.

As noted above, the invention of Popp and Zyl teaches many of the features of the claimed invention and while the invention of Popp and Zyl teaches operation in two-wire mode, the combination does not disclose means for operation in three-wire mode.

Brennan teaches a reader/programmer for two and three wire utility data communications system comprising a connector for connection to three or two power supply terminals (column 6, lines 18-25) wherein when a detector means

determines that power is supplied to either the three or two power supply terminals, the device automatically switches between two and/or three wire operation modes (i.e. when the device detects a connection to the two-wire port or to the three wire port, the mode is automatically switched) (column 19, line 11 to column 20, line 5).

It would have been obvious to one having ordinary skill in the art to modify the invention of Popp and Zyl to include means for operation in three-wire mode, as taught by Brennan, because Popp and Zyl teaches a transmitter for use in pressure measurement and, as suggested by Brennan, the combination would have provided means for a utility meter, such as a pressure or flow meter, to be used in two or three wire modes thereby increasing the versatility of the device while reducing the burden on the user (column 2, lines 7-32).

Further, since the invention of Popp and Zyl employs sleep-mode in order to adhere to power requirements/deficiencies caused by two-wire systems and describes an embodiment wherein the sleep-mode is only performed during a power deficit (Zyl; column 2, lines 13-36) and Brennan teaches switching between two-wire and three-wire systems, it would have been obvious to one having ordinary skill in the art to keep the processor in wake mode during three-wire operations as it is conventional in the art that three-wire operation does not suffer from the power constraints of two-wire systems.

Response to Arguments

10. Applicant's arguments with respect to claims 1-17, 20, and 21 have been

considered but are moot in view of the new ground(s) of rejection.

The following arguments, however, are noted.

Applicant first argues:

> To reduce a power consumption of the processor circuit, in the known electrical transducer (Popp), **the processor circuit is operated at a low clock frequency**. This can be clearly seen from the description, column 1, lines 49-59 and the corresponding English translation, paragraph [0004]:
>
>> The processing of measuring values for dynamic processes takes place on the analog transmission path only. The processor merely carries out corrective interventions on the analog transmission path. The configuration of the measuring transducer and the communication with the external auxiliary devices or computers takes place via the digital transmission path without interrupting the transmission of the measuring values. **The invention makes it possible to realize low clock frequencies for the processor and the analog/digital converter and therefore a low current consumption**.
>
> Popp only discloses an electrical transducer with a processor operated at a low clock frequency. Operating the processor at a low clock frequency clearly means that there is no need to shift the processor into a sleep mode to achieve low current consumption because, with the processor operated at a low clock frequency, current consumption is low.

The Examiner asserts that the fact that Popp discloses that the processor can be operated at a low clock frequency does not indicate that there is no need to shift the processor into a sleep mode as one having ordinary skill in the art would recognize that, while operating at low clock frequencies may reduce the current consumption, shifting the processor into a sleep mode would provide a much lower amount of current consumption, thereby improving the applicability of the processing by allowing its implementation in environments with much more stringent power constraints.

Applicant then argues:

On page 13 of the Office Action, the Examiner has stated that:

Popp's disclosure that "[t]he processor merely carries out corrective interventions on the analog transmission path," does suggest that the processor is not active during normal measurement operation, but is only active to perform corrections once the pressure has been measured.

However, as mentioned above, the Popp reference does not disclose that the processor should not be active during normal measurement operation and the Examiner's conclusion as to what the quoted statement might "suggest" is incorrect.

In fact, the microprocessor used by Popp does not carry out only corrective interventions on the analog transmission path, but the microprocessor also exchanges digital data with an external communication unit. The data exchange is realized by means of high frequency signals with the 4 - 20 mA signal superimposed thereon in such away that its mean value is not compromised (paragraph [00021] of the English translation). Additionally, in column 2, lines 47 - 54 of Popp and in paragraph [0010], on page 5 of the Office's English translation thereof, it is stated that:

The amplifier circuit 12 is connected in series to a measuring transducer interface 13. The measuring transducer interface 13 combines the analog transmission path of the measuring transducer consisting of the combinatorial circuit 6 and the amplifier circuit 12 with the digital transmission path of the measuring transducer consisting of the processor circuit 7. The measuring transducer interface is conventionally connected to a control room ... via a two-wire line 14 .... The communication with the processor circuit 7 is realized by means of a not-shown communication interface that is connected to the two-wire line 14. The analog transmission path for the output signal of the sensor 1 ...consists of the combinatorial circuit 6, the amplifier circuit 12 and the measuring transducer interface 13. The output flowing through the two-wire line 14 immediately follows changes in the differential pressure dp.

Thus, if "during normal operation of the electrical transducer," the microprocessor were to be "shifted temporarily from an awake mode into a sleep mode in which the processor circuit is inactive," as claimed here, it would not be possible for the microprocessor to exchange digital data with an external communication unit because there would not be any data signals from the microprocessor at the second input of the transducer interface 13. As it is clearly described in the Popp reference, the measuring transducer interface 13 combines the analog transmission path with the digital transmission path. If the microprocessor were to be in a sleep mode, such combination would be impossible.

The Examiner asserts that Popp specifically discloses:

> According to the invention, this objective is attained with the characteristics disclosed in the characterizing portion of the claim. The processing of measuring values for dynamic processes takes place on the analog transmission path only. The processor merely carries out corrective interventions on the analog transmission path. The configuration of the measuring transducer and the communication with external auxiliary devices or computers takes place via the digital transmission path without interrupting the transmission of the measuring values. The invention makes it possible to realize low clock frequencies for the processor and the analog/digital converter and therefore a low current consumption.

Therefore, with respect to the measurement, Popp explicitly indicates that the processor is only used to carry out corrective interventions on the analog transmission path. As shown in Figure 1, the sensor "1" outputs the measured values (i.e. dp, p, T) during normal measurement and the processor "7" performs its corrections downstream after the normal measurement has been completed. While Popp does disclose use of the processor for communication with external auxiliary devices, this processor control is not during normal measurement. The communication is in order to transmit the measured data and therefore the normal measurement must have already been carried out.

Applicant argues:

> Finally, on page 14 of the Office Action the Examiner asserts that Figure I taken together Popp's statements concerning use of the processor circuit 7 to calculated correction signals indicates to him that:
>
> > the processor circuit does not perform any operation until the differential pressure dp is output from the transducer and therefore Popp does not suggest that the processor needs to be active during normal operation of the

electrical transducer, but rather suggests that the processor has no use until the electrical transducer has already sensed the differential pressure dp.

This characterization of the Popp reference is clearly erroneous and is based on an incorrect interpretation of what is disclosed in this reference. As can be seen from Figure 1, the sensor 1 determines - at the same time - the differential pressure dp, the static pressure p and the temperature T and converts these parameters into corresponding analog signals. At the same time, as the analog signal corresponding to the differential pressure dp is fed to the first input of a combinatorial circuit 6, this signal is also fed to the input of the analog/digital converter 5.3. Thus, while the processor circuit does not perform any operation until the differential pressure dp is output from the sensor (not the transducer), this also applies to the combinatorial circuit 6 as well as to the whole transducer. It should be clear, that during normal sensing operation of Popp's transducer, the sensor 1 determines the differential pressure dp to be measured. This can be seen from the last two sentences in column 2 and paragraph [0010] of the English translation:

> The analog transmission path for the output signal of the sensor I that corresponds to the differential pressure dp consists of the combinatorial circuit 6, the amplifier circuit 12 and the measuring transducer interface 13. The output current flowing through the two-wire line 14 immediately follows changes in the differential pressure dp.

Clearly, sensing of the differential pressure dp by the sensor 1 is the normal sensing operation of the transducer disclosed by Popp, a fact that does not appear to have been taken into consideration in formulating of the outstanding rejections, and during this normal sensing operation, the processor cannot be inactive for the reasons indicated.

The Examiner agrees that the sensing of the differential pressure dp by the sensor is the normal operation of the transducer. The Examiner again maintains that, as seen in Figure 1, the differential pressure is sensed by sensor "1" and, after being sensed, output to line "2" and therefore, since the processor cannot perform any operation on the sensed data until the differential pressure is output on line "2" and converted by an A/D converter "53", the processor does not need to be active during this normal sensing operation.

The Examiner also asserts that independent claims 1 and 16 require "during normal operation of the electrical transducer, the processor circuit is shifted temporarily from an awake mode into a sleep mode in which the processor circuit is inactive". This limitation does not indicate that the processor must be in the sleep mode throughout the entire normal operation, but only that the processor is shifted temporarily into a sleep mode during the normal operation. Therefore, if Applicant is arguing that the processor's corrections are performed during normal operation, which the Examiner does not agree, as long as the processor is in a sleep mode while the normal measurement is being performed by the sensor, it is still at least temporarily in a sleep mode during normal operation, and therefore meets the limitation in question.

Applicant then argues:

> As for the Zyl patent, as noted in applicants' prior response, the transducer arrangement of this patent does not have an analog measurement signal transmission path. Furthermore, as can be seen from the description of column 2, lines 13-38, Zyl teaches two alternative manners for achieving low power consumption. One technique is analogous to that of Popp in that the clock rate of the processor is reduced, only in this case it is reduced proportionally to a power deficit condition, thus affecting processing speed in a similar manner to the technique of Popp. In the other technique, to which the Examiner makes reference, when a deficit in the ability of the power regulating circuit to meet the requirements of the processor is detected, the processor is shifted into a "'sleep' mode in which program execution is halted." In both of these alternatives, initiation of the power reduction or the sleep mode is triggered by the occurrence of a power deficit.
>
> Thus, a person of ordinary skill viewing the combined teaching of Popp and Zyl, would consider Zyl's alternative technique of adjusting clock speed as the logical modification to apply to Popp since it is related to and compatible with Popp's concept. However, even if Zyl's primary technique of sending the processor into an inactive sleep mode were to be applied to the process and

device of Popp, it would not lead to the present invention but rather would result in a transducer having an analog transmission path and a digital path in which the digital path is operated at a low clock frequency during normal operation and only if there is a power deficit, would the processor be shifted into a sleep mode, the Examiner having ignored Zyl's disclosure of this condition as the triggering factor of use of his sleep mode. Moreover, since the processor is operated at a low clock frequency during normal operation in accordance with Popp's teachings, it is unlikely that the processor would need to be shifted into a sleep mode at all (keeping in mind that Zyl's alternative mode in which the clock rate of the processor is reduced requires no sleep mode), and in any case, the time during which the processor would need to be shifted into the sleep mode would most certainly be much shorter than the time during which it is active, the direct opposite of the present invention.

Moreover, the Examiner's basis for combining of these references is fundamentally flawed not only because of his failure to consider that Zyl's sleep mode is not triggered during normal operating conditions, but rather is used only in the exceptional case of a power deficiency, but it also is flawed because of the errors in his assessment of Popp's disclosure as explained at length above, in this regard, the Examiner's attention is directed to column 6, first full paragraph in which Zyl notes that "the microprocessor must remain fully operative during "real time" operations, a teaching that dictates that the processor of Popp be active for enabling the output current flowing through the two-wire line 14 to immediately follow changes in the differential pressure dp as quoted above.

The Examiner first asserts that the fact the Zyl teaches both an embodiment employing a low clock frequency and an embodiment employing a sleep mode during a power deficit further lends to the combination of Popp and Zyl since one having ordinary skill in the art would recognize that Popp discloses a low clock frequency embodiment and Zyl teaches the desirability to not only employ such a low clock frequency but also, in an environment with more serious power constraints, a sleep mode embodiment may be preferred.

The Examiner further asserts that the invention of Zyl is not included to teach any of the aspects of the analog transmission path or other structural aspects of the

claimed limitations, nor for "real time" operations that are performed by Zyl, which consist of energy pluses, sampling, and A/D conversion, especially in light of the fact that the invention of Popp discloses independent A/D converters (Figure 1). Instead, Popp discloses that rather than being active during the entire measurement process, the processor is only active for a short time to "merely carr[y] out corrective interventions on the analog transmission path."

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent No. 4,524,624 to Di Noia et al. teaches a pressure and differential pressure detector and transmitter for use in hostile environments including a detector arrangement comprising an adder, subtractor, and multiplier.

U.S. Patent No. 5,956,663 to Eryurek teaches a signal processing technique which separates signal components in a sensor for sensor diagnostics.

U.S. Patent No. 5,083,091 to Frick et al. teaches a charge balanced feedback measurement circuit.

JP Patent Application Publication No. 04-359399 to Tamura et al. teaches a three-wire signal processor that converts a three-wire signal into a two-wire signal.

U.S. Patent No. 3,948,098 to Richardson et al. teaches a vortex flow meter transmitter that can be used in two-wire or three-wire operation.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeffrey R. West
Examiner – AU 2857

March 18, 2007